

Applicant: Jukka Alatola et al.
PCT App. No.: PCT/FI2003/000594

Claim Listing

1–10. (cancelled)

11. (new) A method for calibrating the position of blades of a slitter-winder of a paper or board machine, wherein each blade is attached to a blade carriage disposed on a guide, comprising the steps of:

measuring the position of a blade carriage having a blade to be calibrated mounted thereto by a multipoint measurement method;

arranging a positioning member of a calibration tool to touch a slitting edge of the blade to be calibrated;

measuring the position of the calibration tool by a multipoint measurement method;
and

determining the position of the slitting edge of the blade to be calibrated with respect to the blade carriage having the blade to be calibrated, based on the measured position of the calibration tool.

12. (new) The method of claim 11, wherein in measuring the position of the blade carriage having the blade to be calibrated and the position of the calibration tool the same multipoint measurement method is used.

13. (new) The method of claim 11 wherein the position of the blade carriage having the blade to be calibrated is determined by measuring, by means of a sensor, the position of a first measuring member attached to the blade carriage of the blade to be calibrated, and that the position of the calibration tool is determined by measuring with the sensor, the position of a second measuring member attached to the calibration tool, whereby, on the basis of measurement results, the position of the slitting blade edge is determined.

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14. (new) The method of claim 11 wherein the multipoint measurement method is a magnetostrictive measurement method, in which the positions of a position magnet attached to the blade carriage of the blade to be calibrated and of a position magnet attached to the calibration tool are determined by means of a magnetostrictive sensor, the calibration tool being arranged to touch the slitting edge of the blade to be calibrated, whereby, on the basis of measurement results, the exact position of the slitting blade edge can be determined.

15. (new) The method of claim 14 wherein the magnetostrictive measurement method is performed with a magnetostrictive measurement sensor having a first element and a second element positioned below the guide of the blade carriage having a blade to be calibrated, and wherein the positions of the position magnet attached to the blade carriage of the blade to be calibrated and of the position magnet attached to the calibration tool are determined with respect to the position sensor second element.

16. (new) The method of claim 14 wherein, when calibration is carried out, the sensor measuring the position of the calibration tool automatically performs a measurement when it finds the position magnet of the calibration tool.

17. (new) The method of claim 11 wherein, when the calibration tool is arranged in its position, the measurement steps are initiated by pressing a control button.

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18. (new) A device for calibrating the position of blades of a slitter-winder of a paper or board machine, the slitter-winder having pairs of blades comprising a top blade and a bottom blade, each blade being attached to a respective blade carriage which is movable along a guide, which device is disposed in connection with the slitter-winder of the paper or board machine, the device comprising:

 a calibration tool arranged to be attached to the same guide on which the blade carriage of the blade to be calibrated is attached; and
 portions of the calibration tool which form an element for indicating the slitting edge of the blade; and
 apparatus for measuring the position of the calibration tool and the carriage of the blade to be calibrated; and
 apparatus for calculating the position of the slitting edge of the blade to be calibrated with respect to the blade carriage.

19. (new) The device of claim 18, wherein the apparatus for measuring comprises a sensor arranged in connection with the slitter winder, and further comprising:

 a measuring member attached to the blade carriage of the blade to be calibrated, the position of which measuring member can be determined by the sensor;
 wherein the calibration tool element is positionable to touch the slitting edge of the blade; and
 portions of the calibration tool which define a position member for measuring the position of the calibration tool by the sensor.

20. (new) The device of claim 18 wherein the apparatus for measuring comprises a magnetostrictive sensor arranged in connection with the slitter winder, and further comprising:

 a position magnet attached to the blade carriage of the blade to be calibrated; and
 a position magnet attached to the calibration tool.

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21. (new) The device of claim 20 wherein the magnetostrictive position sensor has a first element and a second element which extends beneath the guide on which the blade carriage of the blade to be calibrated is attached, and wherein the positions of the position magnet mounted to the calibration tool and the magnet mounted to the blade carriage of the blade to be calibrated are determined with respect to the position sensor second element.

22. (new) The device of claim 18 wherein the calibration tool is movable along the guide to which the blade carriage of the blade to be calibrated is mounted.

23. (new) A method for changing and calibrating a blade in a slitter-winder of a paper or board machine having an upper and a lower blade, wherein each blade is attached to a blade carriage disposed on a guide, the method comprising the steps of:

changing a selected blade, the changed blade being mounted to a selected blade carriage which is disposed on a selected guide;

applying a calibration tool to the selected guide, the calibration tool having a positioning member which extends to engage an edge of the selected blade;

measuring the location of a first point on the calibration tool which is in a known location with respect to the positioning member;

calculating the position of the positioning member and thereby determining the position of the selected blade edge, based on the measurement of the location of the first point;

measuring the location of a second point on the selected carriage which is fixed with respect to the selected blade edge;

calculating the location of the blade edge with respect to the second point based on the determined position of the selected blade edge; and

moving the carriage to a set position to thereby position the selected blade edge at a desired location.

24. (new) The method of claim 23 wherein the step of applying the calibration tool to the selected guide comprises positioning the calibration tool on the selected guide such that a position magnet mounted to the calibration tool is detectable by a magnetostrictive position sensor, and wherein the step of measuring the location of the first point on the calibration tool comprises determining the position of the position magnet with a magnetostrictive position sensor.

25. (new) The method of claim 23 wherein the step of measuring the location of a second point on the selected carriage comprises determining the location of a magnet mounted to the selected carriage with the magnetostrictive position sensor.

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26. (new) The method of claim 25 wherein the magnetostrictive position sensor has a second element which extends beneath the selected guide, and wherein the positions of the position magnet mounted to the calibration tool and the magnet mounted to the selected carriage are determined with respect to the position sensor second element.